



Original communication

An empirical analysis of suicidal death trends in India: A 5 year retrospective study



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ABSTRACT

Suicide, a major problem worldwide, continues to be a criminal offence in most of the developing countries of the world, including India. This paper retrospectively examines the latest trends and the relevant determinants of the suicidal deaths in one of the most important city of central India- Nagpur of Maharashtra state, carried out for a period of 5 years i.e. 2009–2013. Total 2036 cases were analyzed. An alarmingly increasing trend in the rate of suicides has been observed in the region, which increased from 16% to 22.68% during the study period. The male to female suicide ratio was found to be 2.50:1. The rate of suicidal deaths ranged from 15.34 to 21.74 per 100,000 populations. Hanging was found to be the most preferred mean adopted for suicide by males (54.77%) and females (47.65%), while, Family problems was the most common cause of suicide among both male (38.25%) and female (52.65%). The Suicides were concentrated in the age group of 30–44 years for males (35.76%), while in the age group of 15–29 years for females (51.75%). The prevalence was higher among the people who were married, being as high as 1099 (66.73%) males and 372 (56.45%) females. Highest trend has been found among the people with matriculate/secondary education level. The males with job in private sector accounted for 1007 suicides (61.14%) and 434 (65.86%) females in the category of housewives (non-working, homemakers) committed the same.

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1. Introduction

As Albert Camus quotes “*There is but one truly serious philosophical problem and that is suicide.*” Suicide – a multifaceted problem is described as a voluntary and intentional taking of one's own life. It is, killing oneself on purpose, dying at one's own hand. The word suicide breaks down into the Latin words ‘*sui*’ and ‘*caedere*’, which together translate to “*killing oneself*.” As it is said, nothing about suicide is simple, not even its definition. It is a complex phenomenon.^{1–3}

Sir Thomas Browne was the first to use the term ‘suicide’ in his “*Religio Medici*” in 1642 and the next to come was Walter Charleton, in 1651. Prior to the word “Suicide” being introduced, words like self destruction, self killing and self murder were in practice.⁴ The work, “*Le Suicide*” of Emile Durkheim, a French sociologist gives us the definition of suicide as “death resulting directly or

indirectly from a positive or negative act of the victim himself, which he knows will produce this result.” It excludes the survivors who attempted it.⁵ While “Suicide Attempt” may be defined as a non-fatal self-directed potentially injurious behavior with any intent to die as a result of such behavior. A suicide attempt may or may not result in injury. In the recent past, “Intentional Self-Harm” (ISH) had replaced the term Suicide in the scientific literature due to derogatory nature of the word “Suicide”.

Suicides have been prevalent since times unknown, but it is only in the last 100 years that intensive studies on it from a number of different perspectives have evolved. Various theories about Suicides had come up highlighting different dimensions and concepts. At times sociological theories like that of Durkheim have dominated; at other times educational; behavioral; theological; psycho-analytical; and more recently biological perspectives have been in the forefront.

Suicide is ranked among the top 13 causes of death for individuals of all ages worldwide by World Health Organization (WHO).³ It is said that the most dramatic increase in suicide mortality will be observed in third world countries on account of the socioeconomic and behavioral factors prevalent.⁶ Worldwide, more

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than a million of deaths are annually reported due to suicide of which 20% are Indians,⁷ accounting for 17% of world population. Suicide is among the three leading causes of death among people aged 15–44 years in some countries and the second leading cause of death among those aged 10–24 years these figures do not include the suicide attempts, which are up to 20 times more frequent than completed suicide.⁷ In the last two decades, the suicide rate has increased from 7.9 to 10.3 per 100,000, with very high rates in some southern regions.⁸ According to the National Crime Records Bureau (NCRB); state of Tamil Nadu, West Bengal, Andhra Pradesh, Maharashtra and Karnataka have registered consistently higher number of suicidal deaths during the last few years and together accounted for 56.2% of the total suicides reported in the country.⁹ Maharashtra, a highly populated state of India (9.285% share of population) has a high percentage of suicidal deaths accounting for 11.9% (in 2012) of the total suicides reported in India.^{9,10}

The objective of the current study was to analyze the trends of suicide mortality in the Nagpur city of Maharashtra State in India. It aims at highlighting the issue by studying the suicide cases in relation to the demographic features (like age, gender etc.) social background, extent, method of suicide, causes (motive of suicide) etc., in order to gain an insight regarding the same.

2. Materials and methods

A retrospective study has been conducted in the Nagpur City of Maharashtra, India, on the issue of Suicides, increasing at an alarming rate and becoming one of the major causes of death among the individuals of all ages, worldwide. The cases of Suicides have been studied in context of its rate (magnitude), causes, means adopted, social background etc. The data have been collected with respect to the different dimensions to be analyzed including the age, sex, residence (urban), causes, profession profile, social status, educational status and the means adopted, etc. from the Administrative Section of the Crime Branch of Nagpur Police, Maharashtra, for the period of last five years, that is, from January 2009 to December 2013. As per provisional reports of Census India, population of Nagpur city in 2011 is 2,405,421¹⁰; of which males and females are 1,226,610 and 1,178,811 respectively.

3. Results

The distribution of Suicide data collected for the span of last five years, that is, from 2009 to 2013, is illustrated below.

3.1. Year-wise distribution

The distribution of Suicides year wise on the basis of gender is shown in Table 1. Out of the total 2036 cases, 1647 (71.42%) were males and 659 (28.58%) were females. The average male to female suicide ratio for the span of 2009–2013 was found to be 2.50: 1,

Table 1
Year-wise and gender-wise distribution of suicide cases.

Gender	Year						
		2009	2010	2011	2012	2013	Total
Male	n	271	334	313	364	365	1647
	%	11.75	14.48	13.57	15.79	15.79	71.42
Female	n	98	124	142	137	158	659
	%	4.25	5.38	6.16	5.94	6.85	28.58
Ratio (Male: Female)		2.77:1	2.69:1	2.20:1	2.66:1	2.31:1	2.50:1
Total	n	369	458	455	501	523	2306
	%	16.00	19.86	19.73	21.73	22.68	100

while the highest was found in the year 2009, that is, 2.77: 1. The highest percentage of suicide were in 2013 (22.68% of the total suicide cases) as compared to the least percentage in 2009 (16.00%).

3.2. Cause wise distribution

The gender wise and cause wise distribution of suicide cases in Nagpur city is shown in Table 2. Family problems were the most common cause of suicide among both male (38.25%) and female (52.65%).

3.3. Means adopted

Hanging was the most preferred means as compared to the various means adopted for the purpose of committing suicide (Table 3) among male (54.77%) as well as female (47.65%).

3.4. Age group and gender

The distribution of Suicide cases for 2009–2013, according to age group and gender has been illustrated in Table 4. The Suicide cases were concentrated in the age group of 30–44 years (35.76%) followed by 15–29 years (34.3%) for males, while the highest number of cases in females were found to be in the age group 15–29 years (51.75%) followed by that in the age group of 30–44 years (28.68%). Both these age groups highlight the alarming increase of suicide mortality among the youth.

3.5. Marital status

1099 (66.73%) married males and 372 (56.45%) married females committed suicide during 2009–2013 (Table 5) which was found to be much higher than any other studied group.

3.6. Education level

The highest suicidal trend has been found among the people with matriculate/secondary level of education with 461 males (27.99%) and 189 females (28.68%). It is followed by people with middle-school education with 442 male (26.84%) and 160 female (24.28%) cases (Table 6).

3.7. Profession

When the profession profile of the suicide victims of 2009–2013 was considered (Table 7), the highest rate was found among the males with job in private sector accounting for as high as 1007 (61.14%) suicides. The females in the category of housewives (non-working/homemakers) showed the maximum number of suicides with 434 (65.86%) cases.

3.8. Suicide rate

An increasing trend in the number of suicides per lakh of the population is seen during the study period ranging from 15.34 to 21.74 (Table 8).

4. Discussion

The current study examines the trend and the relevant determinants of the suicidal deaths in one of the most important city of central India- Nagpur. The distribution of Suicide data collected for the span of last five years, that is, from 2009 to 2013 indicates an alarming increase in the rate of suicides except for a minor decrease in 2011. Out of the total 2036 cases of suicides, 2013 recorded the

Table 2

Distribution of Suicide cases from Nagpur City based upon the causes (2009–2013).

Causes	Number of suicidal deaths														Grand total (M + F)		
	Male (M)							Female (F)									
	Age (years)							Age (years)									
	Up to 14	15–29	30–44	45–59	60 & above	Total		Up to 14	15–29	30–44	45–59	60 & above	Total		N	%	
						N	%							n	%	N	%
Bankruptcy or sudden change in economic status	0	9	12	7	1	29	1.76	0	0	2	0	1	3	0.45	32	1.39	
Suspected/Illicit Relation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cancellation/Non settlement of marriage	0	3	3	0	0	6	0.36	0	12	0	1	0	13	1.97	19	0.82	
Not having children (Barrenness/impotency)	0	0	1	0	0	1	0.06	0	1	5	0	0	6	0.91	7	0.30	
Illness due to AIDS/STD	0	2	7	9	2	20	1.21	1	2	1	6	5	15	2.27	35	1.51	
Illness due to Cancer	0	5	7	8	3	23	1.39	0	2	5	2	1	10	1.52	33	1.43	
Paralysis	0	0	1	4	4	9	0.55	0	0	1	1	4	6	0.91	15	0.65	
Insanity/mental illness	0	41	36	23	10	110	6.68	3	15	24	12	6	60	9.10	170	7.37	
Other prolonged illness	0	26	54	66	51	197	11.96	0	11	10	15	23	59	8.95	256	11.10	
Death of dear person	0	4	2	4	1	11	0.67	0	0	3	1	0	4	0.61	15	0.65	
Dowry dispute	0	0	0	0	0	0	0	0	1	1	0	0	2	0.30	2	0.09	
Divorce	0	0	0	0	0	0	0	0	0	1	0	0	1	0.15	1	0.04	
Drug abuse/Addiction	0	92	148	78	11	329	19.98	0	0	0	0	0	0	0	329	14.27	
Failure in examination	3	50	3	0	0	57	3.46	2	54	2	1	0	59	8.95	116	5.03	
Fall in social reputation	1	1	3	0	0	4	0.24	0	0	0	0	0	0	0	4	0.17	
Family Problems	7	204	261	129	29	630	38.25	7	189	122	26	3	347	52.65	977	42.37	
Illegitimate pregnancy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Love affairs	0	57	3	0	0	60	3.64	1	32	1	0	0	34	5.16	94	4.08	
Physical abuse (rape, incest etc.)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Poverty	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Professional/career problems	0	4	7	5	0	16	0.97	0	2	2	0	0	4	0.61	20	0.87	
Property dispute	0	0	0	0	0	0	0	0	0	2	0	0	2	0.30	2	0.09	
Unemployment	0	43	18	2	0	63	3.82	0	1	0	0	0	1	0.15	64	2.77	
Other Causes	0	24	23	21	14	82	4.98	4	19	7	1	2	33	5.00	115	4.98	
Total	11	565	589	356	126	1647	100	18	341	189	66	45	659	100	2306	100	

highest rate 22.68% (523) while the least was observed in the very first year of the study, 16% (369) [Fig. 1].

Notable gender differences in suicide rate were inferred from this study. The Gender ratio (male: female suicides) in the overall period of study was 2.50:1 while the highest recorded ratio 2.77:1 was found in the year 2009 and the lowest 2.20:1 in 2011. The observed results shows the tendency of males to commit suicide is more than double to almost triple as compared to females. This result is concomitant with the other studies performed in various

places including South India (2:1) (2008),¹¹ and the Turkish City-Istanbul (2.39:1) (2007).¹² It also matched with the studies conducted by Taha et al. (2011)¹³ in Cairo city of Egypt, Wafaa et al. (2011)¹⁴ in upper Egypt, Bjerkeset et al. (2008),¹⁵ and Sachil et al. (2013)¹⁶ in Lucknow city of India but disagreed with those of Yip et al. (2000),¹⁷ Phillips et al. (2002)¹⁸ in China, Khaled et al. (2013)¹⁹ in Sohag governorate in Upper Egypt where it was predominant among females. The obtained result is in accordance with the results of Hawton (2000),²⁰ who concluded that the suicide rates in

Table 3

Distribution of Suicides cases by means adopted (2009–2013).

Means adopted	Male (M)							Female (F)							Grand total (M + F)	
	Age group (years)							Age group (years)								
	Up to 14	15–29	30–44	45–59	60 & above	Total		Up to 14	15–29	30–44	45–59	60 & above	Total			
						No.	%						No.	%	No.	%
Over Alcoholism	0	3	8	3	3	17	1.03	0	0	0	0	0	0	0	17	0.74
Drowning	3	82	103	55	26	269	16.33	3	17	13	8	19	60	9.11	329	14.27
Fire/Self immolation	0	36	44	23	9	112	6.80	1	86	55	15	15	172	26.10	284	12.32
Firearms	0	3	1	0	0	4	0.24	0	0	0	0	0	0	0	4	0.17
Hanging	7	340	302	195	58	902	54.77	12	177	94	25	6	314	47.65	1216	52.73
By consuming insecticides	1	82	104	65	20	272	16.52	2	56	24	16	1	99	15.02	371	16.09
By consuming other poison	0	2	2	1	1	6	0.36	0	0	0	0	1	1	0.15	7	0.30
By self infliction of injury	0	0	2	2	2	6	0.36	0	1	0	0	0	1	0.15	7	0.30
Jumping from Building	0	8	11	4	2	25	1.52	0	1	2	1	1	5	0.76	30	1.30
Jumping from Other sites	0	0	2	1	0	3	0.18	0	0	0	0	0	0	0	3	0.13
By overdose of sleeping pills	0	2	1	0	4	7	0.43	0	1	0	1	1	3	0.45	10	0.43
By touching electric wires	0	0	0	1	0	1	0.06	0	0	0	0	0	0	0	1	0.04
By coming under moving Vehicles/Trains	0	7	9	6	1	23	1.40	0	2	1	0	1	4	0.61	27	1.17
Total	11	565	589	356	126	1647	100	18	341	189	66	45	659	100	2306	100

Table 4
Distribution of Suicide Cases according to age group and gender (2009–13).

Age group	Male		Female		Total	
	n	%	n	%	n	%
Up to 14 years	11	00.67	18	02.73	29	01.28
15–29 years	565	34.3	341	51.75	906	39.29
30–44 years	589	35.76	189	28.68	778	33.74
45–59 years	356	21.62	66	10.02	422	18.30
60 year & above	126	07.65	45	06.83	171	07.42
Total	1647	100	659	100	2306	100

most of the countries are higher among males than in females, with China being an exception having very high rates of suicide in females. This can be explained by the fact that females seek help for psychological problems more than males.^{15,21}

Family problems were the most common cause of suicide among both male (38.25%) and female (52.65%) which was in accordance with the study conducted by Taha et al. (2011)¹³ where family problems accounted for about 19.7% of the total cases. Drug abuse/addiction, prolonged illness and insanity/mental illness followed the family problems among males and females respectively in our study. When compared with other studies in Europe and USA, depression came out to be the major cause of suicide. A widely known fact is that more than 90% of people who successfully commit suicide suffer from some psychiatric disorder immediately before the suicide.²²

Hanging was the most preferred means as compared to the various means adopted for committing suicide among male (54.77%) as well as female (47.65%) which was followed by consumption of insecticides among males (16.52%) and by fire/self immolation among females (26.10%). Hanging is a leading method of suicide in Germany and Japan and is the second leading suicide method after intoxication in India; to be noted, hanging was preferred more by nagpurians than the other people of India among whom intoxication prevailed.^{23–25} As hanging is a mode that is easily available universally, it can be expected to be the most common suicide method in many countries worldwide; however, a considerable variation exists internationally. As a justification for this statement, a study of suicide methods in a large number of cases in Japan and the United States revealed that Japan had a very high proportion of hanging (70.4% for males and 60% for females) whereas the proportion was much lower (18.2% for males and 16.2% for females) in the United States. Similarly 32% hanging cases of suicides were reported in a study in Australia. Hanging and self-poisoning with pesticides were the preferred means in south China.^{26–28} Large variation have also been found in the obtained results when compared to other studies where poisoning/toxins are a prevalent mode, like those in the studies of Khaled et al. (2013),¹⁹ Wafaa et al. (2011)¹⁴ and Sachil et al. (2013).¹⁶

The Suicide cases were concentrated in the age group of 30–44 years (35.76%) followed by 15–29 years (34.3%) for males, while the

Table 5
Marital status of suicide victims (2009–13).

Social status	Male		Female		Total	
	n	%	n	%	N	%
Never married	513	31.15	261	39.61	774	33.57
Married	1099	66.73	372	56.45	1471	63.79
Widowed/Widower	25	1.52	22	3.34	47	2.04
Divorcee	0	0	3	0.46	3	0.13
Separated	10	0.61	1	0.15	11	0.48
Total	1647	100	659	100	2306	100

Table 6
Educational status of suicide victims (2009–13).

Education level	Male		Female		Total	
	N	%	n	%	N	%
No Education/illiterate	0	0	0	0	0	0
Primary	293	17.79	136	20.64	429	18.60
Middle	442	26.84	160	24.28	602	26.11
Matriculate/Secondary	461	27.99	189	28.68	650	28.19
Hr. Secondary/Intermediate/pre-university	322	19.55	126	19.12	448	19.43
Diploma	89	5.41	23	3.49	112	4.86
Graduate	39	2.37	23	3.49	62	2.69
Post Graduate and above	1	0.06	2	0.30	3	0.13
Total	1647	100	659	100	2306	100

highest number of cases in females were found to be in the age group 15–29 years (51.75%) followed by that in the age group of 30–44 years (28.68%). Overall the age group of 15–29 years observed the highest suicides (39.29%). This was in contrast with the studies conducted at Malaysia (2008),²⁹ Turkey (2007)¹² and South India (2008)¹¹ where third decade had the maximum number of Suicide cases. The obtained results were more or less in accordance with those of Midha et al. (2001),³⁰ Taha et al. (2011),¹³ Khaled et al. (2012),¹⁹ and Hanna et al. (2011)³¹ where second, third and fourth decades prevailed. The present study revealed that there is a significant low age among female than male for committing suicide in accordance with Vizcarra et al. (2004)³² who reported that “factors associated with higher psychiatric morbidity and suicidal behavior in women in developing countries include early age at marriage, lack of autonomy in choosing male partner (arranged marriage), pressure to have children early in marriage (in many cases for a male offspring), economic dependence on husband and the joint family system. Domestic violence was also stated to be a serious problem in developing countries. Under these circumstances the young married woman's position gets severely compromised which makes her vulnerable to psychiatric morbidity and suicidal behavior”. Okasha et al. (1986)³³ reported that precipitating factors differed according to sex in Egypt, with females more likely to report bereavement, romantic relationship problems and marital problems and males more likely to report financial difficulties and conflicts related to work and schools. Completed suicide victims were more frequently males 20–40 years old (2008).³⁴

The highest number of suicide was by the people who were married that is, 63.79% (for both male & female). 1099 (66.73%)

Table 7
Profession profile of Suicide Victims (2009–13).

Profession	Male		Female		Total	
	n	%	n	%	N	%
Housewife	0	0	434	65.86	434	18.82
Government Service	67	04.07	2	0.3	69	2.99
Service in Private sector	1007	61.14	59	8.95	1066	46.23
Service in Public sector	8	0.49	1	0.15	9	0.39
Student	134	8.14	155	23.52	289	12.53
Unemployed	175	10.63	3	0.46	178	7.72
Self-employment						
(i) Business activity	79	4.80	3	0.46	82	3.56
(ii) Professional activity	125	7.59	1	0.15	126	5.46
(iii) Farming/agriculture activity	9	0.55	0	0	9	0.39
Retired person	37	2.25	0	0	37	1.60
Others	6	0.36	1	0.15	7	0.30
Total	1647	100	659	100	2306	100

Table 8

Rate of Suicide per lakh in Nagpur City with total population of 2,405,421 (Census 2011).¹⁰

Year	Suicides per 100,000
2009	15.34
2010	19.04
2011	18.92
2012	20.83
2013	21.74

married males and 372 (56.45%) married females committed suicide during 2009–2013. The lowest rate among male was found in the group of Divorcees (0%) while separated females committed the least, that is, 1 (0.15%). The result was in contrast with that of Khaled et al. (2012)¹⁹ where 69% of the cases were singles. Another study by Hanna et al. (2011)³¹ reported 60.8% of females were single as compared to 40.2% males. The obtained result does not agree with the idea that Marriage usually has a protective effect against suicide which might illustrate the fact that those people who may be prone to suicide are more likely to be single or to have been divorced or widowed.^{35,36} Khan and Reza (1988)³⁷ came up with the notion that marriage might not be protective in all cultures especially for young women. For instance higher rates of suicide and deliberate self-harm have been reported among married women in Pakistan in comparison to both married men and single women. The possible reasons given for this was that the social, economic and legal discrimination gives rise to psychological stress that leads these women to commit suicide or deliberately harm themselves.

The highest trend of suicide has been found among the people of matriculate/secondary education level with 28.19% of total suicides followed by middle education level with 26.12% cases. A low rate has been observed among the people being post graduates and above. No cases of suicide has been reported among the people with no education, the rate is 0% for both male and female which is in absolute contrast with the result of Khaled et al. (2012)¹⁹ where 81% of suicides were of the uneducated group of people.

The highest rate was found among the males with job in private sector accounting for as high as 1007 (61.14%) suicides. The females in the category of housewives (non-working, homemakers) showed the maximum number of suicides with 434 (65.86%) cases. Overall trend was highest in private sector jobs among both the genders. The study of Hanna et al. (2011)³¹ illustrated that more than one-third (36.1%) of suicidal attempted cases were students. The private sector represented 24.0% as compared to 10.4% among workers

in governmental sector. Housewives and unemployed represented 12.2% and 9.7%, respectively.

5. Conclusion

In conclusion, an increasing trend has been found in the cases of Suicides in Nagpur city. Our analysis of these cases of completed suicide leads us to certain conclusions empirically. In the recent times, the tendency of males to commit suicide has increased from double to triple (three times) than that of females. Mostly, the educated, married males in the age group of 30–44 years with private sector jobs while non-working, housewives in the age group of 15–29 years took up suicide as the only solution to their temporary problems. Hanging was the method of choice while consumption of insecticide and drowning ranked second and third (resp.) as a mean to end one's own life. The present study also highlighted a wide range of the causative factors of suicide with family problems being on top of the list. Creating awareness among the people about these causes; imparting the knowledge of how to handle nerve-racking life situations, various stress relieving exercises & techniques; and proper counseling of the youths at different stages of life are the much needed steps that may be of help with respect to this grave issue. Efforts need to be directed to curb this rising problem and to bring a decrease in the rate of suicide in our society.

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Conflict of interest

The authors have no conflict of interest to declare.

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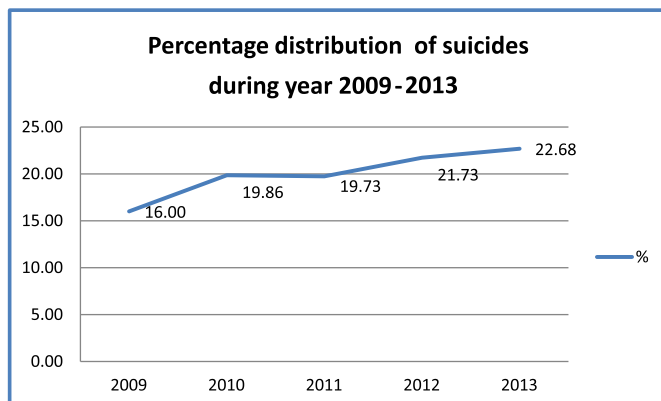


Fig. 1. Percentage distribution of suicides during year 2009–2013 in Nagpur City, India.

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